THE RODENTS OF THE GENUS PLAGIODONTIA

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In 1836 Frederic Cuvier published [1] the description of a large rodent which Alexander Ricord had discovered 10 years before [2] in Haiti. He called the animal *Plagiodontia ædium*, the generic name alluding to the oblique folds of enamel on the molar teeth, the specific name suggested by the local appellation "Rat-Cayes," meaning house rat. In addition to a detailed technical account and a carefully prepared plate showing the external appearance, the skull and the teeth, Cuvier gave a short paragraph on the habits of the "Plagiodonte" taken from notes furnished by the collector. The animals frequented human habitations. They were very good to eat and the Haitians were even then, a century ago, hunting them to the verge of extermination.[3] Two specimens were brought to France by Ricord, the type, and an individual described by Paul Gervais in the first volume of the Histoire Naturelle des Mammifères, 1854 (pp. 346–347). Gervais figures the teeth (p. 346), and it is evident that his drawing is not a copy of Cuvier's.

The accounts written by Cuvier and Gervais long remained the sole basis of our knowledge of *Plagiodontia*. For it was not until February, 1916, that any further specimens were recorded. I then published [4] a short note on some bones, including a mandible with all its cheek teeth, found by W. M. Gabb in a kitchenmidden on San Lorenzo Bay (south shore of Samana Bay), Dominican Republic, in 1869–1871.[5] These specimens had lain for years unnoticed in the

[1] Ann. Sci. Nat., ser. 2, vol. 6, pp. 347–353, pl. 17.

[2] See Mulsant et Verreaux, Hist. Nat. des Oiseaux-Mouches, vol. 2, p. 76, 1875, for date of Ricord's work in the Antilles.

[3] Ces animaux portent à Saint-Domingue le nom de Rat-Cayes, c'est-à-dire Rat des habitations, d'où nous avons tiré le nom specifique que nous leur donnons; ils se rapprochent en effet des lieux habités, mais pendant la nuit seulement, car ils fuient la clarté du jour. Le mâle et la femelle se quittent peu Leur nourriture principale consiste en racines et en fruits, et, comme tous les rongeurs frugivores, ils sont ort bons à manger, et les Haïtiens, qui en sont très friands, les recherchent si soigneusement, qu'ils ont fini par rendre ces animaux très rares (p. 351).

[4] Proc. Biol. Soc. Washington, vol. 29, p. 47, Feb. 24, 1916.

[5] See Gabb, Trans. Amer. Philos. Soc., new ser., vol. 15, pp. 146–147, 1873.

ethnological collections of the National Museum. Later in 1916 I recorded[6] bones which probably represented about six individuals unearthed by Theodoor de Booy[7] at San Pedro de Macoris on the south coast of the island about 60 kilometers east of Santo Domingo City, and other material, probably representing three individuals, which Dr. W. L. Abbott had recently dug from the same deposits at San Lorenzo Bay that had been examined by Gabb 46 years before.

While material for verifying the accuracy of F. Cuvier's diagnosis of the genus *Plagiodontia* was supplied by these discoveries it remained an open question whether or not the animal's extinction, apparently threatened at the period of Ricord's visit, had actually taken place. Vague accounts of a living rodent which might be either a *Plagiodontia* or an introduced agouti[8] have not infrequently been brought back by visitors to the island, but it has been impossible to verify any of them, and the identity of the animal to which they referred could never be determined.

At last through the persistent efforts of Doctor Abbott, who systematically explored both the Haitian and the Dominican Republics during the years 1916 to 1923,[9] it has been shown that the genus *Plagiodontia* still retains its place in the living fauna of the West Indies. On December 2, 1923 Doctor Abbott wrote me from Jovero, southeast of the entrance to Samana Bay:

> Have at last had luck with the Hutia (Plagiodontia?). Up to the present have secured 13, besides 3 embryos. There are skins and skeletons of 10 adults and 3 young in formalin. I was at Guarabo, a settlement in Savannas 10 miles east of this place, and an old man, stimulated by an offer of $5 apiece, brought me 11. He caught them with dogs in hollow trees down near a lagoon near sea shore. Females all pregnant, one fetus at a time. It was miserable at Guarabo, mosquitoes awful, mud and rain most of the time, so we came back here. Another brought me two Hutias last night from about 3 miles west of Jovero. The Hutias must still be abundant in some districts. The Dominicans don't seem to eat them but some dogs hunt them. They can climb to some extent. They are doomed with the coming of the mongoose. Their slow breeding will probably help their extinction.

Though it was evident from this letter that an important discovery had been made the possibility remained that the Hutia of the Samana Province might prove to be an *Isolobodon* and not a *Plagiodontia*. No living member of the genus *Isolobodon* has yet been found, but the flesh of *I. portoricensis* is known to have been used as a com-

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[6] Smithsonian Misc. Coll., vol. 66, No. 12, Dec. 7, 1916.

[7] An account of the deposits in which these bones were found was published by de Booy in 1919: "Santo Domingo Kitchen-Midden and Burial Mound," Indian Notes and Monographs, vol. 1, No. 2 (New York Heye Foundation).

[8] The Brazilian *Dasyprocta aguti* has been successfully established on St. Thomas, Virgin Islands (Miller Proc. U. S. Nat. Mus., vol. 54, p. 508, Oct. 15, 1918).

[9] For brief accounts of Doctor Abbott's work in this region see Smithsonian Misc. Coll., vol. 66, No. 17, pp. 36–39, 1917; vol. 72, No. 1, pp. 34–36, 1920; vol. 22, No. 6, pp. 43–47, 1921; vol. 72, No. 15, pp. 44–47, 1922; vol. 74, No. 5, pp. 62–63, 1923; vol. 76, No. 10, pp. 43–47, 1924.

mon article of food by the natives in Porto Rico, the Virgin Islands, and the Dominican Republic during late pre-Columbian times.[10] Both Gabb and Abbott obtained the remains of this animal together with those of *Plagiodontia* in the kitchenmiddens at San Lorenzo Bay, while Mr. de Booy found it to be by far the most abundantly represented rodent in the large mound which he worked out at San Pedro de Macoris. With the arrival of Doctor Abbott's specimens in Washington the generic identity of the animal with the one described by Cuvier was immediately established; but a comparison of this material with that from San Lorenzo Bay and Macoris suggested the possibility that two species might be represented, and raised the further question as to the exact determination of the animal collected by Ricord. In the hope of obtaining enough specimens to put these doubts to rest I have delayed publication until the present time.

The material now at hand convinces me that the genus *Plagiodontia* includes two species. Unfortunately it is necessary to decide somewhat arbitrarily as to the one which shall bear the name *ædium*. The descriptions given by Cuvier and Gervais are not sufficiently detailed to be conclusive; they might perhaps have been based on either animal. In 1904 I examined the type skin in Paris. The skull could not be found; and I have recently been informed by Mr. J. Berlioz that it is still missing. The skin is mounted and its color is obviously faded from long exposure to light. The notes which I then made are as follows:

Mounted specimen in fair condition, though somewhat faded and with end of tail broken off. Tail naked, smooth, the scales small and not imbricated, irregular in arrangement and form, but tending to be rounded-pentagonal; 30 mm. from base of tail they are scarcely more than 1 mm. in diameter. General color a faded grayish buff, much darkened by blackish and dark broccoli-brown hair tips, but the lighter color everywhere a little in excess. Underparts light isabella-color. Feet indefinite dusky. Ears naked internally, thickly furred along edge and apparently on outer side also. Head and body, 380; tail, 120; hind foot with claws, 74, without claws 68.

On the basis of these notes in conjunction with the two descriptions and figures there appear to be three features which indicate that the animal collected by Ricord was not the one recently found by Doctor Abbott, namely: In the type specimen the tail seems more conspicuously scaled than in the species now occurring on the Samana Peninsula, the color as described by both Cuvier and Gervais and as represented on Cuvier's plate is more yellowish, and the mandibular teeth, as figured by both writers are less like those of the Abbott specimens than they are like those of one found by de Booy at San

[10] See Miller, Proc. U. S. Nat. Mus., vol. 54, pp. 507–508. October 15, 1918

Pedro de Macoris and a series of six jaws which I collected in Haiti in 1925. It is therefore to the species represented by these mandibles rather than to the one collected by Doctor Abbott that I have decided to apply the name *ædium*. If I am correct in so doing the original *Plagiodontia* remains unknown in the living state.

The characters of the two species, so far as it is now possible to summarize them, may be contrasted as follows:

Antero-posterier diameter of crown in m_1 and m_2, measured along the median axis of toothrow fully equal to and frequently greater than the transverse diameter measured in line perpendicular to this axis; reentrant enamel folds relatively wide and not excessively long; size larger: length of mandible to tip of angular process in adults exceeding 60 mm., mandibular toothrow (alveoli) in adults about 24 mm ---------- **P. ædium**

Antero-posterior diameter of crown in m_1, and m_2, measured along the median axis of toothrow distinctly less than transverse diameter measured in a line perpendicular to this axis; reentrant enamel folds relatively narrow and long; size smaller: maximum length of mandible to tip of angular process in adults about 55 mm. or less, mandibular toothrow (alveoli) in adults less than 21 mm ---------- **P. hylæum**

PLAGIODONTIA HYLÆUM, new species

Type.—Young-adult male (skin and skeleton) No. 239887, United States National Museum. Collected at Guarabo, 10 miles east of Jovero, Samana Province, Dominican Republic, November 23, 1923, by Dr. W. L. Abott.

Characters.—General appearance essentially as in *Plagiodontia ædium* but color probably darker and less yellowish, size slightly less, and mandibular teeth with crowns compressed along the axis of toothrow.

External features.—In size and external characters the animal is not unlike *Geocapromys browni* of Jamaica, but the color is lighter and more uniform, the entirely naked tail extends beyond the outstretched hind feet by about one-fourth or one-third of its length, the ears are so small as to be almost completely buried in the fur (in an adult preserved in alcohol, No. 239898, the ear measures: height from meatus 20, height from crown 12, width 12.6; the general depth of the surrounding fur is about 19, with longest hairs 29), the feet are heavier, with more robust, less curved claws, the claw on the thumb is decidedly better developed, and the surfaces of the palms and soles are less conspicuously and completely covered by minute tilelike thickenings of epidermis, these rarely assuming the definite subcircular or subpentagonal form which they commonly show in *Geocapromys browni*. A large area including the heel and much of the postero-external region of the sole is nearly or quite smooth. The tail is naked except that the fur of the body extends out on its extreme base for a distance of about 10 mm., and the rest of its surface is sprinkled with minute hairs (about 2 mm. in length) so sparsely

spaced that they might readily escape notice. The epidermis of the tail is faintly and irregularly divided into tilelike plates about 1 mm. in diameter. In some individuals these plates are so poorly developed that, over large areas, their outlines practically disappear, in others they are rather definitely arranged in irregular rings the posterior edges of which are enough raised to suggest a slight inbrication. The fur is deeper and less coarse than that of *Geocapromys browni*, and the light rings on the dorsal hairs are less contrasted with the dark elements of the color.

Color.—General color throughout nearly the wood-brown of Ridgway (1912), darkening to buffy-brown on chest and belly, and paling to avellaneous on anterior part of throat; inner surface of hind legs and area between them and around base of tail tinged with prouts-brown. On the underparts the light brown is uniform; on the entire dorsal and lateral surface it is finely intermingled with dark brown, much less conspicuously than in *Geocapromys browni*, producing an effect of slight clouding but not of any obvious speckling. In certain lights the longer hairs reflect a silvery gloss. The hairs of the back are all light plumbeous at base (this color not appearing at the surface of the fur). The longer hairs have long dark brown tips, the shorter ones have each a wood-brown subterminal annulation about 5 mm. wide and a very short dark brown tip. On the sides and underparts the basal color tends to lose most of its plumbeous tinge and to become light wood-brown, so that the hairs of the belly are often practically uniform from base to tip.

Skull.—The skull (pl. 1, figs, 1, 1*a*, 1*b*) is slightly smaller than that of *Geocapromys browni*, but its general form is not very different. Its chief peculiarities as compared with the skull of the Jamacian animal are as follows. In dorsal aspect: The less breadth between lacrimals and at level of anterior zygomatic root as compared with that at the coronal suture and across posterior zygomatic region; the more anterior position (mostly in front of the middle of orbits) of the swellings caused by the frontal sinuses; the more sharply defined postorbital process. In lateral aspect: Less depth of rostrum as compared with that of braincase; antorbital foramen about as deep as orbit instead of much deeper than orbit, its upper, outer margin sloping obliquely forward instead of backward in relation to alveolar line; much more slender zygoma, the upper margin of which does not bear an orbital process; jugal slender, without posterior concavity and postero-inferior process; excessively long paroccipital process (its length about double the vertical diameter of auditory bulla instead of slightly less than diameter of bulla). In ventral aspect: Much smaller incisive foramina and narrower anterior zygomatic region; least longitudinal diameter of glenoid surface very slightly greater than transverse diameter instead of about three times as great as

transverse diameter. Mandible: Narrow sigmoid flexure and high position of coronoid process, its tip almost reaching articular level; greater width and nearly horizontal border of masseter ridge, particularly in the region beneath m_2 and m_3; more conspicuous protuberance under root of pm_4; broader under surface of angular process; much less oblique symphysis; protuberance marking base of incisor situated at about middle of line connecting inner margin of alveolus of m_1 with posterior extremity of symphysis instead of entad to middle of m_3.

Detailed comparison with the skull of *Plagiodontia ædium* is impossible at present. Nothing is known as to the whereabouts of the two skulls collected by Ricord, and the only specimens which I am able to refer to the original species are mandibles. Cuvier's figure shows two characters which, if actually as represented, should be diagnostic, namely, there are no postorbital processes (these are always conspicuous in *P. hylæum*), and the vacuity formed by the combined orbit and temporal fossa, as viewed from above, is much smaller than in any of the skulls collected by Doctor Abbott. The mandible of *Plagiodontia hylæum* is smaller and more lightly built than that of *P. ædium*, but there appear to be no tangible peculiarities in form.

Teeth.—The teeth (pl. 1 figs. 1*a*, 1*c*; also Smithsonian Misc. Coll., vol. 66, No. 12, pl. 1, fig. 4, December 7, 1916) differ from those of *Plagiodontia ædium* as figured by Cuvier and Gervais and as represented by one mandible from San Pedro de Macoris, Dominican Republic (pl. 1, fig. 2) and six from San Michel, Haiti, in a general compression of the crowns along the axis of the toothrow, so that the grinding surface of each tooth and of the series of teeth taken as a whole is noticeably shorter in proportion to its width. In the specimen from San Pedro de Macoris the length of the entire mandibular grinding surface is 23.2 mm., greatest width transversely to longitudinal axis 5.4, ratio of width to length, 23.3. In the two largest specimens of *P. hylæum* (Nos. 239891 and 239893) the length is 21.0, the width 6.0, and the ratio of width to length 28.6. In the type the same measurements and ratio are 19.0, 5.2, and 27.1. The reentrant folds extending outward from the inner side of the teeth are very narrow and so long that the tip of the anterior fold in m_1 and m_2 pushes across to a position where it almost fills the apex of the anterior outer salient angle; the length of the posterior border of this fold is conspicuously greater than the transverse diameter of the crown measured in a direction perpendicular to the long axis of the folds. In *P. ædium* the tip of the first inner reentrant leaves free a definitely triangular dentine area in the apex of the anterior outer salient angle, and the length of the posterior border of this fold is not greater than the transverse diameter of the crown. The

first and second salient folds on the lingual side of the teeth are usually truncate at the tip in *Plagiodontia hylæum*, while in *P. ædium* a lanceolate termination for all three folds appears to be normal, though the material is not in sufficiently good condition to show this is a reliable diagnostic character. In both species the enamel margin of the cheekteeth becomes thin and nearly or quite discontinuous for a varying distance along the anterior apex of pm_4 and along the anterior border of each of the molars in the region of its contact with the tooth in front of it. This process appears to be more pronounced in *P. hylæum* than in *P. ædium*.

No satisfactory comparison of the maxillary teeth with those of *P. ædium* is now possible.

Measurements.—For measurements, see accompanying table. "Head and body" and "tail" were measured by the collector. The "hind foot" includes the claws. All specimens with complete measurements are from Guarabo, Dominican Republic.

Remarks.—The series of ten adult skins is very uniform, such individual variation as occurs on the dorsal surface being confined to slight differences in the yellowness of the wood-brown element of the color, and to the greater or less abundance of dark tipped hairs on the back and sides. Ventrally there is slight variation in the tone of the buffy-brown, this assuming a faint drabby cast in some of the skins. An immature individual (No. 239894) is more grayish than the adults, but the difference is not conspicuous. The skulls and teeth are equally constant in all their characters. Perhaps the two most variable features of the skull are the exact size and form of the frontal swellings over the sinuses, and the outline, broadly or narrowly triangular or occasionally peglike, of the postorbital processes. The enamel pattern is very constant and is apparently not subject to variations due to age.

EXPLANATION OF PLATE

All figures natural size

FIG. 1. *Plagiodontia hylæum.* Skull and right mandible of type.

FIG. 2. *Plagiodontia ædium.* Right mandible. from San Pedro de Macoris, Dominican Republic.

Measurements of Plagiodontia

Number	Sex	Head and body	Tail	Hind foot	Skull: Greatest length	Condylobasal length	Palatal length	Zygomatic breadth	Interorbital constriction	Mastoid breadth	Occipital depth	Median rostral depth	Nasal	Combined breadth of nasals	Diastema	Mandible	Mandibular symphysis	Maxillary toothrow (alveoli)	Mandibular toothrow
P. ædium:																			
217126 [1]																62+	28+		24.0
[2]																	27.6+		23.4
P. hylæum:																			
239886	♂	348	127	70	72.4	64.2	36.4	39.0	16.6	26.4	16.8	15.0	23.0	8.0	15.8	51.0	21.4	18.8	18.6
239887 [3]	♂	372	140	72	74.0	66.4	38.2	40.6	18.8	26.0	16.6	16.0	24.6	9.0	16.6	52.6	23.0	19.2	19.4
239890	♂	380	130	74	74.8	68.0	40.4	42.6	20.2	27.4	16.8	17.0	24.6	9.6	17.2	53.8	23.4	20.2	20.2
239891	♂	363	137	71	78.2	70.2	40.8	44.0	19.8	29.2	17.4	16.8	25.8	10.8	17.6	54.4	25.2	21.0	20.6
239892	♂	386	146	72	75.0	67.8	39.2	44.4	19.2	27.2	17.2	16.4	23.6	9.8	17.2	55.0	25.0	19.8	19.6
239895	♂	405	130	74	74.2	65.4	38.2	43.0	19.0	28.0	17.8	17.8	25.0	10.2	16.6	52.0	24.2	18.8	19.4
239888	♀	384	143	74	77.2	67.8	38.0	42.8	20.0	26.8	17.2	15.6	24.0	9.8	16.2	55.2	24.0	20.4	20.2
239889	♀	387	140	70	72.8	60.6	37.8	42.6	19.0	27.0	17.0	15.8	23.4	9.0	16.2	54.2	24.6	19.8	20.0
239893	♀	365	140	74	76.0	61.2	38.8	39.8	19.0	27.2	16.6	16.0	24.8	9.8	16.6	55.2	25.0	20.6	20.6
239896	♀	360	143	71	74.0	64.0	37.0	40.8	17.6	26.8	16.8	17.0	25.4	9.6	15.4	52.6	23.8	20.0	19.8
200412 [4]																52+	24+		20.2
217112 [1]									18.8			16+		10.2	17.4			20.4	
221023 [4]																52.4	22.6		19.0
221024 [4]															17.6			20±	

[1] San Pedro de Macoris, Dominican Republic.
[2] San Michel, Haiti; not numbered.
[3] Type.
[4] San Lorenzo Bay, Dominican Republic.